

Claims

We claim:

- 5           1. A system for monitoring a thermal barrier coating, comprising:  
            a combustion turbine component coated with a thermal barrier coating, the  
            coating comprising:  
                a thermal stimulatable substance adapted to function as a visual  
                high-lighter, and  
10           a mechanism to adhere the thermal stimulatable substance in the  
            coating;  
            a detector to detect removed pieces of the thermal stimulatable substance;  
            and  
            an analyzer to analyze the removed pieces of the thermal stimulatable  
15           substance to determine damages of the coating.
2. A system according claim 1, further comprising an output device to output a  
a damage readable form.
- 20           3. A system according claim 1, wherein the component is coated with a plurality of  
layers of thermal barrier coatings.
4. A system according claim 1, wherein a plurality of components are coated with a  
thermal barrier coating.  
25           5. A system according claim 4, wherein a plurality of components are coated with  
thermal barrier coatings, the thermal barrier coating containing different thermal  
stimulatable substances.
- 30           6. A system according to claim 1, wherein the stimulatable substance is an alkali  
metal or an alkaline earth metal.
7. A system according claim 1, wherein the combustion turbine component is a  
turbine blade or a turbine vane.

8. A system according claim 1, wherein the combustion turbine component is a combustion engine.

5           10. A system according claim 1, wherein the combustion turbine component is a heat shield.

11. A method for monitoring a thermal barrier coating, comprising:  
providing a thermal stimlatable substance adapted to function as a visual high-  
10 lighter;  
providing a mechanism to adhere the thermal stimlatable substance in the coating;  
providing a detector to detect removed pieces of the thermal stimlatable  
substance; and  
providing an analyzer to analyze the removed pieces of the thermal stimlatable  
15 substance to determine damages of the coating.

12. A method according claim 11, further comprising: providing an output device to output a damage readable form.

20           13. A method according claim 11, further comprising: providing a mechanism for remote monitoring.

14. A method according claim 11, further comprising: providing a mechanism for real-time monitoring.

25           15. A method according to claim 11, wherein the stimlatable substance is a alkali metal or a alkaline earth metal.

16. A component, comprising:  
30           a thermal barrier coating with a thermal stimlatable substance adapted to function as a visual high-lighter, and a mechanism to adhere the thermal stimlatable substance in the coating;  
a detector to detect removed pieces of the thermal stimlatable substance;  
and

an analyzer to analyze the removed pieces of the thermal stimulatable substance to determine damages of the coating.

5 17. A component according claim 16, wherein the component is a combustion turbine component.

18. A component according claim 16, wherein the component is coated with a plurality of layers of thermal barrier coatings.

10 19. A component according claim 16, wherein the thermal barrier coating containing different of thermal stimulatable substances.

20. A combustion turbine component according claim 16, wherein the stimulatable substance is an alkali metal or an alkaline earth metal.  
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21. A component according claim 16, wherein the component is a metal or ceramic component.